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**DEVICE FOR LOWERING AND RAISING A
WINDOWPANE IN A MOTOR VEHICLE DOOR**

[Vorrichtung zum Absenken und Anheben einer
Fensterscheibe einer Krattfahrzeugtür]

Dipl. Ing. Günther Böhm and Dipl. Ing. Rainer Fornoff

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<u>Inventors</u>		Dipl. Ing. Günther Böhm and Dipl. Ing. Rainer Fornoff
<u>Applicant</u>	:	Audi AG
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Specification

This invention relates to a device for lowering and raising a windowpane in a motor vehicle door according to the preamble of Claim 1.

A generally known device for lowering and raising a windowpane in a motor vehicle door consists of a window lifter device with an electrical drive motor and a control device, which comprises the operating switches (window lifter switch) in the vehicle passenger compartment for the functions of "lowering" and "raising." In this known device, the windowpane is shifted not with an otherwise customary crank drive but with an electric motor that can be turned on.

In conjunction with the above device, it is also generally known to provide a holding circuit that after touching the operating switch maintains the "lowering" or "raising" functions until the complete lowering or complete raising of the windowpane so that the operating switch need not be kept down throughout the entire time the windowpane is being shifted. The function that is preserved by the holding circuit can be interrupted by again operating the operating switch during the shifting motion.

¹ Numbers in the margin indicate pagination in the foreign text.

In a typically related known central closing device on a motor vehicle (DE-OS 36 30 004) as the vehicle is locked with a key and in addition to a central locking of the lock devices, all drive motors are also triggered from open windowpanes (and possibly a sliding roof) in the closing direction so that when the vehicle is locked to provide protection against theft, all window openings (and possibly the sliding roof opening) will be closed. For this purpose, the drive motors are triggered via a switch in the locking device and the latter's voltage supply is again turned off via an associated time switch after a predetermined span of time.

Furthermore, a typical device for lowering and raising a windowpane in a motor vehicle door is known (DE-PS 33 01 071) where a drive motor can be influenced both from an operating switch and additionally from a control device with a door switch and an associated time circuit in such a way that when the motor vehicle door is opened via the switching position of the door switch, the windowpane will automatically be moved into a lowered position, and after the window has been closed, it is again lifted into its upper terminal position. This automatic lowering during the opening of the door, however, takes place merely by a relatively small amount so that, as a result, the windowpane is opened merely by a crack. The idea here is to make sure that the air, which as the door is closed is

additionally forced into the passenger compartment from the outside of the vehicle, can again immediately escape through the crack of the lowered windowpane. The idea is to reduce the door closing noises.

Furthermore, the idea is to facilitate the design of a sealing body that is retained on the side of the superstructure for a frameless windowpane, which sealing body has a leg that grasps around the pane from the outside where, as a result of the lowering action, the windowpane, during the opening and closing of the door, is not engaged with the sealing body, thus ensuring the perfect opening and closing of the door.

Furthermore, a device for lowering and raising a windowpane in a motor vehicle is known (FR 20 44 191) where one also uses a drive motor and a control device and where the control device can be triggered by an operating switch in the form of a window-lifting switch in the interior of the vehicle. Furthermore, the control device is connected with the ignition key switch that so engages the circuit that the device as a whole, when the ignition key is pulled out, will be turned off for safety reasons. In order to facilitate the operation of the window-lifting device also from the outside with the ignition key pulled out, there is arranged an additional operating switch that works independently of the ignition key switch on the cheek of the door.

Another device for lowering or raising a windowpane in a motor vehicle (JP 2-2 52 877 A. in: Patents Abstracts of Japan, Sect. M, Vol. 14 (1990), No. 583 (M-1064)) comprises a control device that is triggered via an operating switch inside the vehicle and additionally from an associated central locking system. The central locking system, in turn, is remote-triggered via a separate transmitter at an interval from the vehicle. The window-lifting device can also be triggered via this remote control.

For aerodynamic reasons, the side windowpanes in modern passenger cars are also greatly arched and retracted on top toward the center of the vehicle. If a vehicle door is only slightly opened, as this is often the case in tight parking lots, then the arched pane protrudes into the car entry space and can thus constitute a hindrance when getting into and out of the car.

The object of the invention therefore is so to develop a typical device for lowering and lifting a windowpane in a motor vehicle door that one can achieve an improvement for the more comfortable entering and leaving of a car.

This problem is solved with the help of the characterizing features in Claim 1.

According to Claim 1, the control device by way of an additional switch comprises an additional handle button switch

that can be operated from an external handle button of the door lock associated with the vehicle door and which can thus be operated from the outside of the vehicle. With the help of the handle button switch, one can trigger the "lowering the windowpane function" via a time switch and a release switch that can be operated with a locking device of the vehicle door in case the locking device becomes unlocked and in case the release switch is thus operated and, furthermore, the handle button and thus also the handle button switch were operated at least by a certain waiting time that is predetermined by the time switch.

As a result, from the outside of the vehicle with the vehicle door still closed after the vehicle has been opened, the windowpane can be lowered as a result of the protracted activation of the external handle button in accordance with the predetermined waiting time. In that way, particularly in the case of frameless windowpanes according to Claim 2, one can facilitate the more comfortable entry [into the car] in tight parking slots with the door only partially opened because, after the windowpane has been lowered, the arched portion of that windowpane directed toward the inside of the vehicle, will be removed out of the car entry area.

After entering the car, the previously lowered windowpane is again lifted and closed by working the corresponding operating switch.

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An embodiment of the device with the features according to Claim 3 is particularly advantageous here. In this case, it suffices by operating an operating part (operating switch or handle button) merely to trigger the "lowering" or "raising" functions so that this function is then maintained by means of a holding circuit up to the complete lowering or complete raising of the windowpane. The operating part can thus - during the time the windowpane is being switched - already be let go so that no unpleasant time loss will thus result. In the known manner, the automatic shifting of the windowpane into one of its terminal positions can be interrupted during the shifting process by again operating the operating part.

According to Claim 4, the control device for the "lowering the windowpane" function can also be triggered by an internal handle button inside the vehicle in conjunction with the time switch where the internal handle button is operated for a certain waiting time. In that way, the windowpane can be lowered only by operating the internal handle button for easier exiting from the vehicle.

According to Claim 5, a time span of about 1 second proved practical with regard to the waiting time predetermined by the timed circuit. When the external or internal handle button of the vehicle door is briskly operated when the parking conditions are not tight and when the vehicle door is opened, then the

associated windowpane will not be lowered because, in that case, the vehicle door can be opened wide enough anyway for comfortably entering the car without hindrance by the windowpane. When the external or internal handle button is operated for a period longer than the waiting time of 1 second, on the other hand, there is a deliberate lowering of the windowpane that can be triggered from outside the vehicle and this time the interval of 1 second does not represent an uncomfortably long waiting time.

According to Claim 6, the device advantageously cooperates with a known central closing system. In that system, as the vehicle is locked, all locks are closed, and in addition, all drive motors of open windowpanes are triggered and the panes are closed. In that way, to ensure comfortable exiting in tight parking slots, an obstructing windowpane can be lowered from the inside even before the passenger gets out by operating the corresponding operating switch. After exiting without being hindered by the windowpane, the vehicle door is then closed and the lowered windowpane is closed via the central closing system.

A particularly advantageous development is achieved by the features according to Claim 7. After the "lowering the windowpane" function has been triggered by the external or internal handle button, the "raising the windowpane" function is automatically triggered via an associated door contact switch

the next time the vehicle door is closed. The windowpane is thus closed after the invention-based lowering for comfortable exiting and entering automatically without any further action by the driver.

According to Claim 8, the handle button switch as microswitch can be used especially for the external handle switch also by way of a multiple function: In a first function in conjunction with the closed position of the closing cylinder by operating the external handle button, one can trigger a closing cylinder heating unit in the known manner. When the closing cylinder, on the other hand, is in the open position, the invention-based windowpane lowering can be triggered (after a waiting time of 1 second).

For the sake of the invention-based development of the device when one uses a known central closing device and a closing cylinder-heating unit, there is no need for any additional expensive parts because only already present parts are used for the invention-based windowpane lowering so that the invention-based device can be implemented at a reasonable price.

The invention will now be explained more thoroughly with further details and features in a drawing and a flow chart.

Fig. 1 is a perspective side view of a vehicle body;

Fig. 2 is a flow chart illustrating the process as one gets into a motor vehicle and

Fig. 3 is a flow chart illustrating the process as one gets out of a vehicle.

Fig. 1 illustrates a vehicle body 1 with a vehicle door 2 where a frameless windowpane 4 can be lowered (arrow 5) in a door housing 3 by means of an electrical window-raising device. Windowpane 4 is retracted upward toward the vehicle center by a bulge 6.

The broken line in Fig. 1 shows the vehicle door 2 in a partially opened position (arrow 7); opening the door further is often not possible in tight parking conditions. By swinging the door housing 3, one then gets a still relatively large entry opening in accordance with interval 8. In the upper area, on the other hand, because of bulge 6 in windowpane 4, the entry opening is restricted to the small interval 9 for a preferably upright comfortable entry without any physical twisting. With the windowpane 4 lowered, one can see that the entry opening for comfortable entry is enlarged also in the upper area to the interval 8 where, furthermore, increased arm movement clearance is created.

According to the invention, using an external handle button 10 after opening vehicle door 2 and after operating the handle button (arrow 11) for a period of time more than 1 second, one can so trigger the window-lifting device that windowpane 4 will

be lowered. The procedure, illustrated in Fig. 2, thus applies to the car entry activity.

Upon approaching a parked and locked vehicle, one can recognize whether there is a tight parking slot, in other words, whether it is more comfortable to enter with the windowpane lowered or with the door wide open where bulge 6 in windowpane 4 would not represent a hindrance. In the second case, the right branch 12 of the diagram according to Fig. 2 applies where the entering procedure takes place upon the opening of vehicle door 2 (central lock ZV), the (fast) opening of the door via handle button 10 and to the entry action plus the closing of the door.

In case of tight parking conditions, on the other hand, one can comfortably enter the car in accordance with the left branch 13 of the diagram: Here again, vehicle door 2 is first of all opened up and then handle button 10 is activated for a period of time in excess of 1 second. As a result, the window-lifting device is triggered and windowpane 4 goes down. Preferably, the control is so designed that after initiating the downward movement, the latter is performed completely up to the lowered terminal position even after the handle button has been let go. After entering the vehicle, the door is closed and windowpane 4 is again automatically raised via the door contact switch. For a simpler embodiment without control via the door contact

switch, the windowpane is raised by means of the window-lifting switch located inside the vehicle. /3

Getting out of the vehicle is visibly also more comfortable in tight parking conditions when windowpane 4 is lowered. The vehicle dismounting procedure is illustrated in the diagram according to Fig. 3.

Under normal space conditions when the vehicle door 2 can be opened wide, one exits from the vehicle in the usual manner in accordance with the right branch 14 of the diagram according to Fig. 3 in that the door is opened by quickly operating the internal handle button after which the door is closed and the vehicle is locked with the key.

In tight parking slots where vehicle door 2 cannot be opened fully, on the other hand, one proceeds according to the left branch 15 in Fig. 3: First of all, by operating the internal handle button for more than 1 second, one lowers the windowpane. Then the door is opened, one gets out of the vehicle with the windowpane lowered and the door is closed again. Now vehicle door 2 is closed, and using a built-in central lock (ZV) with central closing device, the windowpane is again raised into the closed position (by activation with the door key from the outside of the vehicle). In an embodiment with a control via the door contact switch, the windowpane is automatically raised again after the door has been closed.

With the help of the object of the invention, one can thus make it easier to enter and leave vehicles in tight parking conditions, something that represents help and improvement for use of a vehicle, particularly for physically less agile and less mobile persons.

Claims

1. Device for the lowering and raising of a windowpane in a motor vehicle door consisting of the following:

a window-lifting device with a drive motor and with a control device that comprises at least one operating switch (window-lifting switch) inside the vehicle for the "lowering" and "raising" functions plus another switch with which is associated a time circuit,

characterized in

that the additional switch is an additional handle button switch that can be operated from an external handle button (10) of the door lock associated with one of the vehicle doors (2) and thus from the outside of the vehicle and

that using the handle button switch via the associated time circuit and a release switch that can be operated with a locking device of the vehicle door (2), one can trigger the "lower the windowpane" function in case the locking device becomes unlocked and thus activates the release switch and, moreover, handle button (10) and thus the handle button switch would be activated

at least during a certain waiting time predetermined by the time circuit.

2. Device according to Claim 1, characterized in that the vehicle door is made without a window frame.

3. Device according to Claim 1 or 2, characterized in that after triggering the "lowering" or "raising" function, this function is maintained by a holding circuit up to the complete lowering or complete raising of the windowpane (4) so that the operating part (operating switch or handle button 10) need not be kept activated during the entire time that windowpane (4) is being shifted and

that the particular triggered function maintained by the holding switch can be interrupted by again operating the operating part during the shifting time.

4. Device according to one of Claims 1 to 3, characterized in that the control device for the "lowering the windowpane" function can be triggered also by an internal handle button in the vehicle interior in conjunction with the time circuit when the internal handle button is activated for a certain waiting time.

5. Device according to one of Claims 1 to 4, characterized in that the waiting time predetermined by the time circuit amounts to about 1 second.

6. Device according to one of Claims 1 to 5, characterized in that on the vehicle, there is provided a central closing system by means of which as the vehicle is locked with the help of a key along with a central locking, all drive motors for open windowpanes (4) can be triggered so that those windowpanes will be raised and completely closed.

7. Device according to one of Claims 1 to 6, characterized in that after the "lowering the windowpane" function has been triggered by the external or internal handle button, the "lifting the windowpane" function is triggered automatically via an associated door contact switch the next time the vehicle door is closed.

8. Device according to one of Claims 1 to 6, characterized in that the handle button switch as a microswitch is used in a multiple function, both for a known closing cylinder heating device and for lowering the windowpanes where the separation of functions depending on the closing cylinder position is so accomplished that when the closing cylinder is in the closed position, the closing cylinder heating unit and when the closing cylinder is in the open position the windowpane lowering can be triggered.

3 pages of drawings.

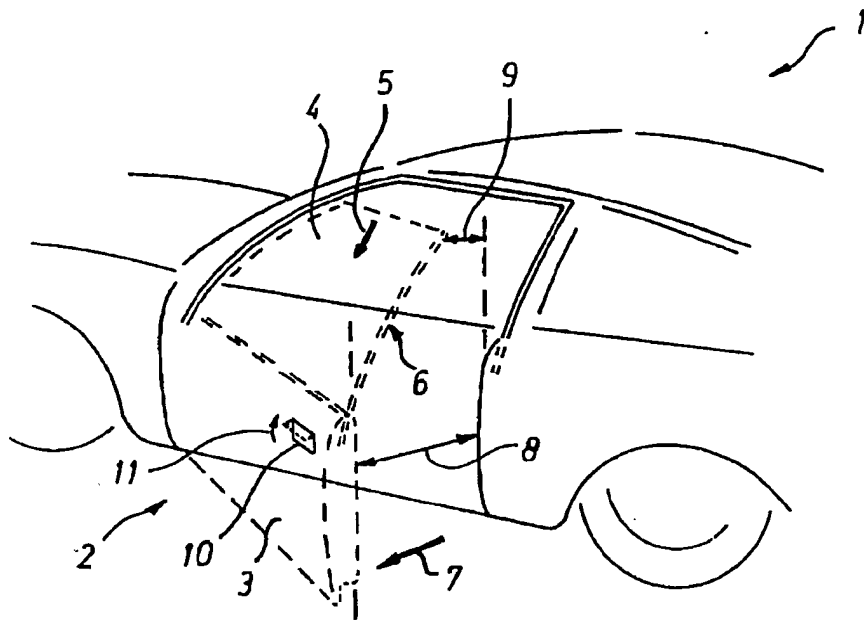


FIG.1

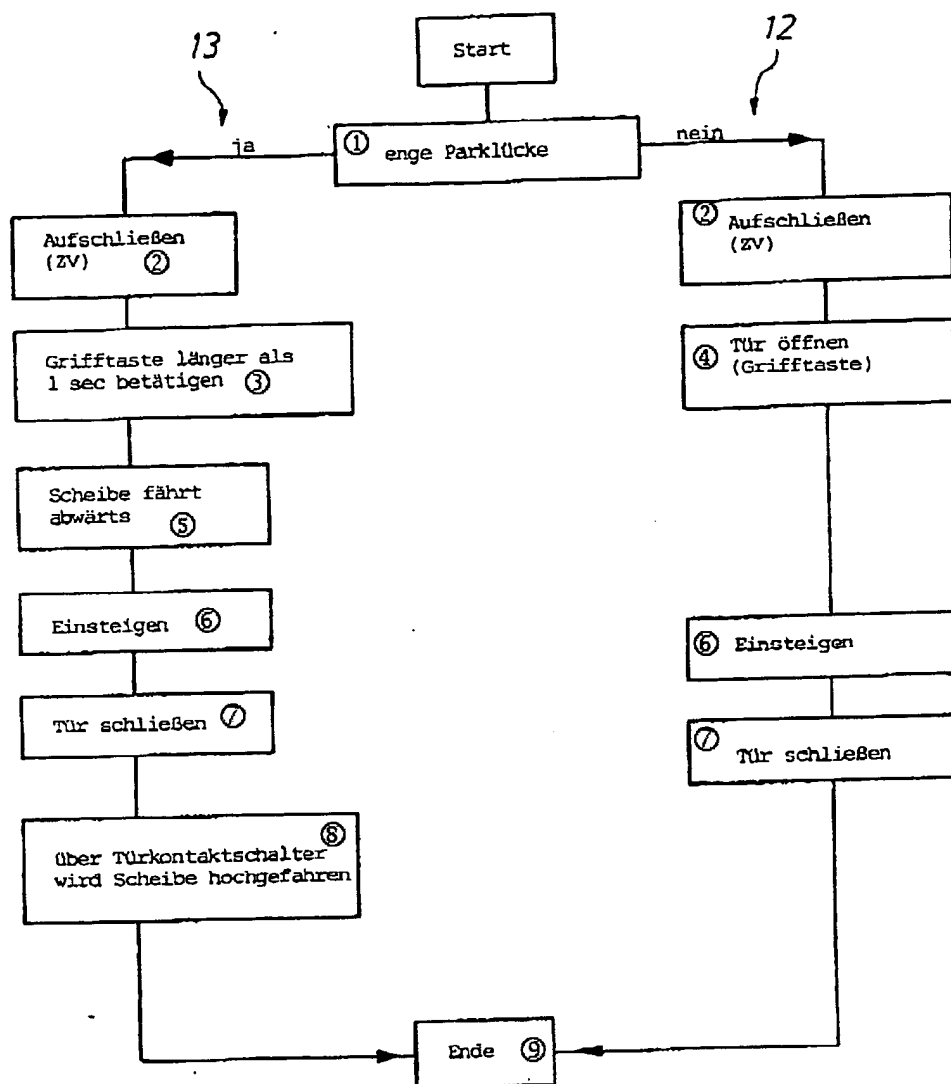


FIG.2

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[Key: 1) Narrow part in slot; 2) Opening (ZV); 3) Operate handle button for more than 1 second; 4) Open door (handle button); 5) Pane goes down; 6) Entering; 7) Close door; 8) Pane is raised via door contact switch; 9) End; 12) No; 13) Yes].

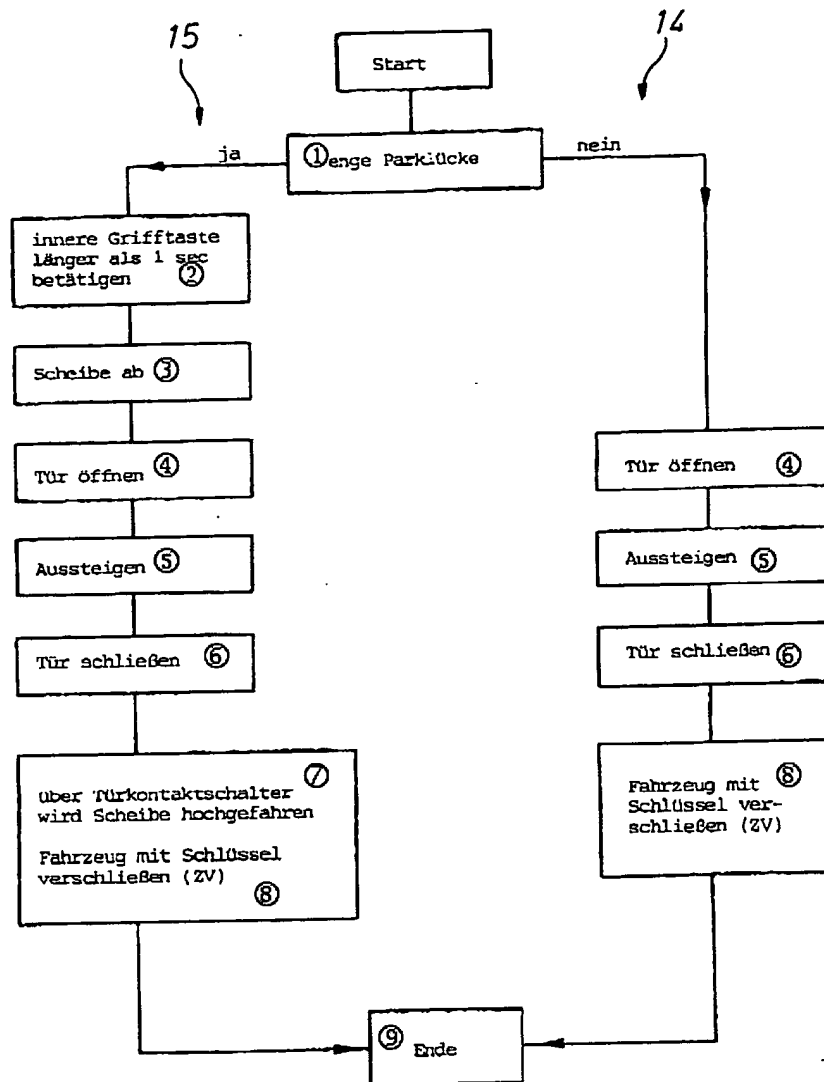


FIG.3

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[Key: 1) Narrow parking slot; 2) Operate internal handle button for more than 1 second; 3) Pane down; 4) Open door; 5) Get out; 6) Close door; 7) Pane raised via door contact switch; 8) Close vehicle with key (ZV); 9) End; 14) No; 15) Yes].

Deutsches Patent- und Markenamt

München, den 19. September 2000

Telefon: (0 89) 21 95 - 2428

Aktenzeichen: 100 11 851.8-23

Deutsches Patent- und Markenamt · 80297 München

Bayerische Motoren Werke AG
Patentanwälte

80788 München

Eingegangen
27. Sep. 2000

AJ-3

AOL

Anmelder:
s. Adr.

Ihr Zeichen: AJ-34 Zo/He Em11433

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Prüfungsantrag, wirksam gestellt am 10. März 2000

Eingabe vom

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Die Prüfung der oben genannten Patentanmeldung hat zu dem nachstehenden Ergebnis geführt.

Zur Äußerung wird eine Frist

von vier Monaten

gewährt, die mit der Zustellung beginnt.

~~Für Unterlagen, die der Äußerung gegebenenfalls beigelegt werden (z.B. Patentansprüche, Beschreibung, Beschreibungsteile, Zeichnungen), sind je zwei Ausfertigungen auf gesonderten Blättern erforderlich. Die Äußerung selbst wird nur in einfacher Ausfertigung benötigt.~~

~~Werden die Patentansprüche, die Beschreibung oder die Zeichnungen im Laufe des Verfahrens geändert, so hat der Anmelder, sofern die Änderungen nicht vom Deutschen Patent- und Markenamt vorgeschlagen sind, im einzelnen anzugeben, an welcher Stelle die in den neuen Unterlagen beschriebenen Erfindungsmerkmale in den ursprünglichen Unterlagen offenbart sind.~~

Hinweis auf die Möglichkeit der Gebrauchsmusterabzweigung

Der Anmelder einer nach dem 1. Januar 1987 mit Wirkung für die Bundesrepublik Deutschland eingereichten Patentanmeldung kann eine Gebrauchsmusteranmeldung, die den gleichen Gegenstand betrifft, einreichen und gleichzeitig den Anmeldetag der früheren Patentanmeldung in Anspruch nehmen. Diese Abzweigung (§ 5 Gebrauchsmustergesetz) ist bis zum Ablauf von 2 Monaten nach dem Ende des Monats möglich, in dem die Patentanmeldung durch rechtskräftige Zurückweisung, freiwillige Rücknahme oder Rücknahmefiktion erledigt, ein Einspruchsverfahren abgeschlossen oder - im Falle der Erteilung des Patents - die Frist für die Beschwerde gegen den Erteilungsbeschluss fruchtlos verstrichen ist. Ausführliche Informationen über die Erfordernisse einer Gebrauchsmusteranmeldung, einschließlich der Abzweigung, enthält das Merkblatt für Gebrauchsmusteranmelder (G 6181), welches kostenlos beim Patent- und Markenamt und den Patentinformationszentren erhältlich ist.

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Dienstgebäude
Zweibrückenstraße 12 (Hauptgebäude)
Zweibrückenstraße 5-7 (Breiterhof)
Cincinnatistraße 64
Rosenheimer Straße 116
Balanstraße 59

Hausadresse (für Fracht)
Deutsches Patent- und Markenamt
Zweibrückenstraße 12
80331 München

Telefon (089) 2195-0 Bank:
Telefax (089) 2195-2221 Landeszentralbank München 700 010 54 (BLZ 700 000 00)

Internet-Adresse <http://www.patent-und-markenamt.de>

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In diesem Bescheid ist folgende Entgegenhaltung erstmalig genannt. (Bei deren Nummerierung gilt diese auch für das weitere Verfahren):

/1/ DE 42 03 512 C1

Der Prüfung liegen die Ansprüche 1 bis 6 zugrunde.

Aus /1/, insbesondere Sp. 2, Z. 22-26 und 48-54, ist ein Verfahren zur Einstiegserleichterung bei einem Kraftfahrzeug bekannt, bei dem nach einem Entriegelungsbefehl sowie einem nachfolgenden Öffnen der Fahrzeugsür die Scheibe der Fahrzeugsür vollständig abgesenkt und nach dem Schließen der Fahrzeugsür wieder vollständig geschlossen wird. Dabei ist es für den Fachmann aus /1/ auch nahegelegt, den Entriegelungsbefehl über eine Fernsteuerung auszulösen. Die Maßnahme, dass der Entriegelungsbefehl zweimal erfolgt, ist für den Fachmann naheliegend, da bei einer nur einmaligen Betätigung, die Scheibe immer beim Öffnen betätigt werden würde, auch wenn es nicht gebraucht wird. Deshalb ist ein zusätzlicher Befehl notwendig, um eine Unterscheidung der Befehle treffen zu können. Die zweimalige Betätigung ist dabei eine Möglichkeit und wird außerdem vom Anmelder in der Anmeldung als Stand der Technik beschrieben (vgl. S.1, z. 20-22). Damit ist die Lehre nach dem Anspruch 1 dem Fachmann aus /1/ nahegelegt.

Der Anspruch 1 ist damit mangels erfinderischer Tätigkeit nicht gewährbar.

Mit dem wesentlichen Bekannt sein des Verfahrens wird der Fachmann durch Kenntnis von /1/ auch zu der Vorrichtung nach dem Anspruch 4 geführt, so dass auch dieser mangels erfinderischer Tätigkeit nicht gewährbar ist.

Die Merkmale der entsprechenden Unteransprüche ergeben sich ebenfalls aus dem aufgezeigten Stand der Technik, bzw. betreffen Maßnahmen fachgemäßer Art.

Mit den vorliegenden Unterlagen kann eine Patenterteilung nicht in Aussicht gestellt werden; es muß vielmehr mit der Zurückweisung der Anmeldung gerechnet werden.

Falls eine Äußerung in der Sache nicht beabsichtigt ist, wird eine formlose Mitteilung über den Erhalt des Bescheides erbeten.

Prüfungsstelle für Klasse E 05 F

Hanschke

Hausruf: 2879

Ausgefertigt

Anlagen: Abl. von 1 Entgegenhaltung


Regierungsangestellte

Mr



GERMAN PATENT AND
TRADEMARK OFFICE

September 19, 2000
File No.: 100 11 851.8-23

TO:

Bayerische Motoren Werke AG

80788 München

Your Ref.: AJ-34 Zo/He Em11433

Request for Examination of March 10, 2000

The examination of the above-mentioned patent application
had the following result. A period of

four months

is granted with respect to the response, starting with the
date of delivery

The following citation was cited for the first time in this office action (if numbered, the numbering will also apply to the continued procedure):

/1/ DE 42 03 512 C1

The examination is based on Claims 1 to 6.

From /1/, particularly Column 2, Lines 22 - 26 and 48-54, a method is known for facilitating the entry in the case of a motor vehicle, in which, after an unlock command as well as a subsequent opening of the vehicle door, the window of the vehicle door is lowered completely and, after the closing of the vehicle door, is completely closed again. In this case, it is also suggested by /1/ to a person skilled in the art to trigger the unlock command by way of a remote control. The measure that the unlock command take place twice, is obvious to a person skilled in the art because, in the case of a one-time actuation, the window would always be actuated during the opening, even when it is not needed. An additional command is therefore required in order to be able to differentiate between the commands. In this case the double actuation is a possibility and, in addition, is described by the applicant in the application as prior art (compare Page 1, Lines 20-22). The teaching according to Claim 1 is therefore suggested to the person skilled in the art from /1/.

Claim 1 can therefore not be allowed because of a lack of inventive activity.

As a result of the fact that the method is known, the person skilled in the art, because of the knowledge of /1/, is also led to the system according to Claim 4, so that this claim can also not be allowed because of a lack of inventive activity.

The characteristics of the corresponding subclaims are also found in the cited state of the art or relate to measures of the art.

On the basis of the present documents, the allowing of a patent cannot be promised. A rejection of the application should therefore be expected.

If no response is intended in this case, an informal acknowledgment of the receipt of this office action is requested.

Examiner for Class E 05 F
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